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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,265	05/01/2001	Kohei Suzuki	43888-105	3094

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EXAMINER	
WINTER, GENTLE E	
ART UNIT	**PAPER NUMBER**
1746	

DATE MAILED: 11/17/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/845,265	SUZUKI ET AL.	
	Examiner	Art Unit	
	Gentle E. Winter	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 September 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) *14-17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claim 1-13, in Paper No. 7 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1 and 10 are rejected under 35 U.S.C. 102(a) as being anticipated by United States Patent No. 6,555,268 to Inoue.

4. Claims 1 and 10 are drawn to a non-aqueous electrolyte secondary battery/electrode comprising a positive electrode comprising a compound oxide containing lithium. Column 2, line 38 *et seq.* disclosing "a positive electrode plate using lithium containing composite oxide".

5. A negative electrode comprising a carbon material; (column 2, line 27 *et seq.* The present invention relates to the manufacture of the negative electrode for rechargeable batteries using non-aqueous electrolyte containing carbon material which intercalates and deintercalates lithium and binder.)

6. A separator interposed between said positive electrode and said negative electrode. See column 6, line 10 *et seq* especially line 19 *et seq*; disclosing a "separator **5** made of a porous polyethylene film is interposed between the positive electrode **1** and negative electrode **3**.")

7. A non-aqueous electrolyte comprising a non-aqueous solvent and LiPF6 dissolved therein. See column 5, line 51 *et seq* disclosing: "The most preferable non-aqueous electrolyte of the present invention is an electrolytic solution containing at least ethylene carbonate and ethylmethyl carbonate, with LiPF.sub.6 as the supporting salt."

8. Wherein said negative electrode contains 0.6 to 1.7 parts by weight of a particulate modified styrene-butadiene rubber and 0.7 to 1.2 parts by weight of a thickening agent per 100 parts by weight of said carbon material. See column 3, line 39 *et seq*. disclosing a range of between 0.3 and 4.0.

9. Where the total amount of said particulate modified styrene-butadiene rubber and said thickening agent is 1.3 to 2.4 parts by weight per 100 parts by weight of said carbon material. See column 7, line 59 *et seq*: "Battery A of the present invention when styrene content in styrene butadiene co-polymer of the binder (A) is 10, 20, 50, 70, or 80%; and styrene content in styrene butadiene co-polymer of the binder (B) is 70, 80, 85, or 95%. A mixing ratio of the binder (A) and binder (B) is 2 parts in proportion to carbon material 100 parts.")

10. Finally, the concentration of LiPF6 in said non-aqueous electrolyte is 0.6 to 1.05 mole/liter. Column 5, line 58 *et seq*. disclosing: "The concentration of supporting electrolyte dissolved in non-aqueous solvent is not also specified, but between 0.2 and 3 mol/l is preferable. In particular, between 0.5 and 2.0 mol/l is most preferable."

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 2, 7, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Inoue and Igarashi et al. With respect to claims 2 and 11, Igarashi discloses styrene-acrylonitrile-butadiene see column 6, line 12 *et seq*. (styrene-acrylonitrile-1,3-butadiene-methyl acrylate copolymer). The artisan would have been motivated to make the instant combination for the reason explicitly set forth in the abstract of Igarashi, namely: "A non-aqueous electrolyte secondary battery having the electrode as a positive electrode and/or a negative electrode [with the indicated binder] exhibits a minimized reduction in capacity at repeated charge-discharge cycles."

3. As to claim 7, disclosing that he concentration of LiPF6 in the non-aqueous electrolyte is about 0.7 to 0.9 mole liter. The exact range is not disclosed in the prior art of record. Igarashi discloses a 1 mole/liter solution at column 11, line 1 *et seq*. The artisan would have been

motivated to optimize the concentration, at the time the invention was made, in an effort to optimize electroconductivity, especially at low temperatures. Additionally, it has been held that that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

4. Claims 3, 5, 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Inoue and Igarashi as set forth above and United States Patent No. 5,707,763 to Shimzu et al.

5. Claim 3, further limiting claim 2 and disclosing that the copolymer is in the form of a core-shell type particle. Shimzu discloses the missing element. Namely, providing a binder for batteries in the form of a nonaqueous dispersion comprising core-shell composite fine particles. Shimzu et al. further provides the motivation for making the instant combination. Namely to provide a binder for batteries which can be mixed with electrode materials is usable for electrode materials susceptible to an adverse influence of water, and does not swell in organic electrolytes.

6. As to claims 5 and 6, disclosing that the mean particle size is 0.05-0.4 microns, the same (0.05-1 micron) is disclosed in *inter alia* the abstract and column 6, line 7 *et seq.* of Shimizu. The particle size is optimized for dispersion and performance characteristics. Carboxymethyl cellulose is disclosed at *inter alia* column 6, line 45.

7. Claim 12, further limiting claim 11 and disclosing that the copolymer is in a form of a core-shell type particle. Igarashi discloses styrene-acrylonitrile-butadiene see column 6, line 12 *et seq.* (styrene-acrylonitiile-l,3-butadiene-methyl acrylate copolymer). The artisan would have been motivated to make the instant combination for the reason explicitly set forth in the abstract of Igarashi, namely: "A non-aqueous electrolyte secondary battery h.avin.8, tile electrode as a positive electrode and/or a negative electrode [with the indicated binder] exhibits a minimized reduction in capacity at repeated charge-discharge cycles." Shimzu discloses, providing a binder for batteries in the form of a nonaqueous dispersion comprising core-shell composite fine particles. Shimzu et al. further provides the motivation for making the instant combination. Namely to provide a binder for batteries which can be mixed with electrode materials is usable for electrode materials susceptible to an adverse influence of water, and does not swell in organic electrolytes.

8. Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Inoue, as discussed above, and United States Patent No. 4,873,277 to Boutni. Each and every limitation of claim 8 is disclosed in Inoue as set forth with respect to claim 1 above, except Inoue fails to disclose that the positive electrode contains .4 to 2 parts by weight of a particulate modified acrylic rubber per 100 parts by weight of said compound. Boutni discloses at column 7, line 33 *et seq.* examples of acrylic elastomers that can be used include 2-ethylhexacrylate. Boutni further indicates that the monomer charge may contain small amounts, i.e., 1% to 20% by weight of the amount of acrylate monomer. The artisan would have been motivated to make the

combination so that the particles can retain their size and shape during subsequent processing steps.

9. Claim 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Inoue, Igarashi, Shimzu, as set forth above and PGPub 2001/0053475 to Ying et al. Each and every limitation of claims 4 and 13 is disclosed in the aggregated teachings of Inoue, Shimzu, and Igarashi, except that the combination fails to explicitly teach the claimed FT-IR peak ratios. At paragraph **[0234]**, Ying discloses each and every limitation of claims 4 and 13. The peaks are presumed to correspond to concentration of the associated functional groups in the resultant copolymer.

10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Inoue and Boutni, as set forth above, and PGPub 2001/0053475 to Ying et al. Each and every limitation of claim 9 is disclosed in the aggregated teachings of Inoue and Boutni except that the combination fails to explicitly teach the claimed FT-IR peak ratios. At paragraph **[0234]**, Ying discloses the missing element of claim 9. The peaks are presumed to correspond to concentration of the associated functional groups in the resultant copolymer.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (703) 305-3403. The examiner can normally be reached on Monday-Friday 7:00-3:30.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

13. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gentle E. Winter
Examiner
Art Unit 1746

November 3, 2003

RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700